Response to Comments for the Water Quality Standards for Coastal and Great Lakes Recreation Waters Rule

November 2004

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EPA
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Agency

Response to Comments for the Water Quality Standards for Coastal and Great Lakes Recreation Waters Rule

Issue: Hawaii

Organization Name: Department of Environmental Services City and County of Honolulu
Document ID: 235
Comment ID: 292

Comment:
The EPA has determined that the State of Hawaii Water Quality Standards (WQS) do not satisfy BEACH Act requirements and is therefore proposing to apply the 35 cfu/100 ml enterococcus geometric mean and single sample maximum criteria to Open Coastal Waters, i.e. marine waters up to 600 feet deep. We firmly believe that these criteria should not be applied to the entire Open Coastal Waters zone because "swimming, bathing, surfing or similar water contact activities" do not take place up to the 600-foot depth. Section 11-54-08(b) of the WQS already specifies an enterococcus GM standard for marine recreational waters within 1000 feet of shoreline. We feel that the determination of the appropriate primary contact activity zone should be left up to DOH, who has primacy on water quality standards for the State of Hawaii.

Organization Name: Department of Environmental Services City and County of Honolulu
Document ID: 235
Comment ID: 296

Comment:
Application of EPA Marine WQ Bacterial Criteria to Hawaii Open Coastal Waters

On p. 41732 of the July 9, 2004 Proposed Rules, EPA is including Hawaii in the rulemaking because there are no numeric criteria protecting State waters beyond 300 meters from shore, although these waters are designated for recreation in the State's water quality standards. Further, on p. 41742, Sections 131.41(e)(2) and (3) propose to essentially apply marine waters criteria to Hawaii Open Coastal Waters. We feel that applying the marine waters criteria to the entire Open Coastal Waters zone, i.e. shoreline to 600-foot depth, is not in keeping with the BEACH Act of 2000 for the following reasons:

1. In Section 5 of the BEACH Act the term "Coastal Recreation Waters" includes:

"(i) the Great Lakes and (ii) marine coastal waters (including coastal estuaries) that are designated under section 303(c) by a State for use for swimming, bathing, surfing, or similar activities."

Primary contact activities such as swimming, bathing, surfing, do not occur in areas of 600-foot depth on Oahu, which lies over 1.5 miles offshore.

2. Section 11-54-03 (c)(2) of the Hawaii Water Quality Standards (WQS) states:

"It is the objective of class A waters that their use for recreational purposes and aesthetic enjoyment be protected."

This applies to the Class A waters of the Open Coastal Waters zone (shoreline to 600-foot depth).

There is no definition of "recreational purposes" in the WQS. It appears recreational purposes in this section of the WQS is not limited to just primary contact activities but any full contact or incidental contact recreational activity in Class A waters. Primary contact activities do not occur

out to 600-foot depths. There may be incidental contact, which these proposed regulations are not addressing.

Another reason why we feel that recreational purposes in this section of the WQS is not limited to only primary contact activities is that the WQS also specifies recreational use for deeper Class A Oceanic Waters. Oceanic waters means "all other marine waters outside of the 183 meter (600 feet or 100 fathom) depth contour". It appears that the intent is to protect deep ocean recreation e.g. sailing, and recreational purposes in the WQS covers general marine recreation. Of course, it would be even more unlikely that primary contact activities would occur in waters outside of the 600-foot depth.

3. We believe that the intent of Section 11-4-8(b) Specific criteria for recreational areas of the Hawaii WQS is to protect the public health of recreational beach users as required by the BEACH Act. The shoreline to 300-meter from shore area is generally where primary contact activities occur, however a recreational survey would be in order to better determine where primary contact activities take place. Further, the existing enterococcus geometric mean limit of 7 c.f.u./100ml is the same type of limit found in the 1986 Ambient Water Quality Criteria for Bacteria. When the State DOH adopted the 7 c.f.u./100 ml standard, they followed the 1986 document and used an illness rate of 10 per 1,000 swimmers instead of the 19, which correlated to geometric mean limit of 35 c.f.u./100 ml. We feel that the 7cfu/100 ml GM standard is overly restrictive and support EPA's proposal to apply the 35 cfu/100 ml GM standard to the shoreline to 300 meter area.

We recommend that the State Department of Health, City and County of Honolulu and other affected counties conduct a statewide recreational survey to determine where primary contact activities occur and where the 35 cfu/100 ml GM limit should apply. BEACH funds could be used to fund the survey. Until such time it is determined how far out from shoreline primary contact activities do occur, the EPA should not apply the 35 cfu/100 ml criterion for waters outside of 300 meters from shore.

Organization Name: State of Hawaii Department of Health/Environmental Health Administration
Document ID: 195
Comment ID: 394

Comment:
Waters to be Covered: The State prefers to retain the 300 meter/1000-ft boundary in the State's current rule, demarcating the more frequently used near shore open coastal recreational waters from less-frequently used open coastal and oceanic waters further offshore. While Hawaii's rules designate recreation as a use for class A marine waters, and those waters extend three miles from shore, HAR section 11-54-8(b) designates the 300 meters/1000 feet from shore as "marine recreational waters" and only that section sets indicator bacteria limits for marine waters. Section 11-54-8(b) will retain that distinction in our proposed state amendment. DOH has not so far seen a need to adopt bacterial water quality standards for waters beyond 300 meters/1000 feet from shore.

In any event, this is an issue of importance. The City and County of Honolulu challenges whether there is actual full body contact use of waters more than 1000 feet from shore and sees a multi-million dollar cost to implement the proposed federal rules. Without taking a position on the City's concerns, DOH believes that the State should retain the ultimate authority to determine the extent of the waters covered by indicator bacteria standards, consistent with federal law, and be able to address the issue through rule making and public participation procedures here in Hawaii.

Response:
For information on specific States and Territories, see the preamble to today's rule, in particular section V.B., Which States and Territories are Included in Today's Rule?

This final rule applies to coastal recreation waters, as discussed in the preamble to today's rule, in particular section IV.A., Application of the Rule to Coastal Recreation Waters. Today's rule does not designate uses but rather establishes criteria for marine waters designated by Hawaii for swimming, bathing, surfing, or similar water contact activities. Section 11-54-03(c)(2) of the Hawaii water quality standards defines the objectives [designated uses] of Class A ocean waters to be for "recreational purposes", as noted by the commenter. However, the same part of the Hawaii water quality standards goes on to speak about "recreation in and on these waters." Therefore, EPA interprets Hawaii's water quality standards to designate Class A ocean waters for swimming, bathing, surfing, or similar water contact activities. If the State believes that primary contact recreation does not occur in certain waters that State could conduct a use attainability analysis consistent with 40 CFR 131.10(g) to remove the use.

EPA thanks the commenters who provided information on progress toward full compliance with the BEACH Act requirements.

Issue: SSM

Organization.Name: American Forest and Paper Association
Document ID: 191
Comment ID: 483

Comment:
Lastly, AF&PA holds that the rule should clarify that multiple samples should be used to effectively determine the impairment status of recreational waters, as opposed to the single sample maximum values called for in the proposed rule.

Organization Name: Association of Metropolitan Sewerage Agencies
Document ID: 227
Comment ID: 285

Comment:
Interpretation of "Single Sample Maximum"

In the July 9 proposal's preamble, EPA seeks comment on interpretations of the term "single sample maximum (SSM)" because the 1986 criteria document does not interpret the meaning of the term. EPA posits that one possible interpretation is that the SSM is a single value never to be exceeded. AMSA strongly disagrees with this interpretation, as it is inconsistent with other EPA guidance and not reflective of the level of protection the 1986 criteria are intended to provide.

Organization Name: Association of Metropolitan Sewerage Agencies
Document ID: 227
Comment ID: 287

Comment:
AMSA's Recommended Approach

The BEACH Act requires EPA to promulgate criteria that are "as protective of human health as" the 1986 criteria. The interpretation of the SSM is critical to demonstrating whether the criteria are in fact "as protective." As stated above, the 1986 criteria document does not interpret the term "single sample maximum," discusses SSMs solely in the context of beach closures, and states that "in deciding whether a beach should be left open, *it is the long term geometric mean bacterial density that is of interest. Because of day-to-day fluctuations around this mean, a decision based on a single sample (or even several samples) may be erroneous, i.e., the [single] sample may exceed the recommended mean criteria even though the long-term geometric mean is protective, or may fall below the maximum even if this mean is in the nonprotective range*" (January 1986; page 9).

The May 2002 draft bacteria implementation guidance (page 5) further indicates that "[i]n terms of criteria setting, the targeted level of protection is the illness rate, *and the most direct relationship between measurements of bacterial levels and illness rate is the geometric mean of measurements taken over the course of a recreation season.*" This is consistent with the proposal's preamble statement at 41725 that "the geometric mean has the most direct relationship to the illness rate." Therefore, as EPA goes on to say in the preamble, "EPA could interpret the phrase 'as protective of health as' the 1986 bacteria criteria document *to apply only to the geometric mean.*" AMSA believes this is the most reasonable interpretation and recommends that

EPA only promulgate the geometric mean in the final rule, leaving the SSM available for use as an implementation tool for making beach opening and closure decisions only.

C. *Alternative Limited Application Approaches*

EPA's May 2002 draft bacteria implementation guidance (page 46) recommends that states use only the geometric mean component for National Pollutant Discharge Elimination System (NPDES) water quality-based effluent limits. AMSA strongly recommends that the regulatory text, if EPA insists that it include the SSM in the criteria, be modified to plainly state that the SSM is to be used only for making beach closure and opening decisions as originally intended in the 1986 criteria document, and not for assessing attainment of standards, developing total maximum daily loads (TMDL)s or developing NPDES permit limits.

Alternatively, if EPA will not clearly limit use of the SSM to beach opening/closing decisions, AMSA recommends that EPA modify the proposed regulatory text to state that the SSM shall not be exceeded only when there is insufficient data to determine that the geometric mean criterion is being met. A sufficient number of samples for comparison with the geometric mean criterion provide an indication of swimming-associated health risks superior to reliance on single values from single samples. Where a statistically sufficient number of samples is available (at least five tests evenly spaced over thirty days, according to EPA), application of the geometric mean criterion is as protective as application of a SSM criterion set equal to a confidence limit where such a data set does not exist. The SSM is a surrogate for the geometric mean in the absence of a suitably large data set to protect against the risk of exceeding the geometric mean. Therefore, in the presence of a suitably large data set, reliance upon the geometric mean criteria from the 1986 bacteria criteria document completely satisfies the "as protective as" test.

Organization Name: Buckeye Florida
Document ID: 172
Comment ID: 235

Comment:
Single Sample Maximum (SSM) interpretation - The EPA epidemiological studies showed a correlation between the geometric mean and gastroenteritis. No studies were presented showing connection to SSMs. Therefore, Buckeye supports the establishment of the water quality criteria based on the geometric mean only. SSMs should continue to be used as guidance for use only in public health decisions like beach closures. Obviously, if a SSM is exceeded often, the geometric mean will be exceeded.

Organization Name: Buckeye Florida
Document ID: 172
Comment ID: 238

Comment:
Alternative Options for Categorization of Coastal Recreation Waters - Again, the use of the geometric mean as the water quality criteria and using the SSMs for public health decisions at beaches precludes the need to issue this guidance. EPA acknowledges the benefits of a simplified approach by limiting the number of SSMs, yet also acknowledges that "one size does not fit all". The use of the geometric mean only water quality criteria provides the beneficial simplification desired while still expecting states and territories to adopt their own criteria that can include SSMs if appropriate and defensible.

Organization Name: California Regional Water Quality Control Board
Document ID: 203
Comment ID: 94

Comment:
Use of the Single Sample Maximum

"The 1986 bacteria criteria document does not interpret the meaning of the term "single sample maximum". One interpretation is that it [the SSM] is a single value never to be exceeded."

The Regional Board agrees that this is a valid definition that should be used for both beach closure and opening decisions and for water quality assessments and regulation of discharges. The main opposition to the inclusion of SSMs in water quality standards appears to be the high day-to-day variability in bacteria density in single samples. Nonetheless, a direct correlation exists between the density of bacteria in a single sample and the likelihood of contracting a swimming-associated illness. The Santa Monica Bay Restoration Project epidemiological study found that swimming in waters contaminated by urban runoff increases the risk for coughing with phlegm, vomiting, ear discharge, chills, and significant respiratory diseases (fever and nasal congestion, fever and sore throat, etc.). The study analyzed the relationship between the total-to-fecal coliform ratio, previously studied bacterial indicators (total coliform, fecal coliform, *E. coli*, and enterococcus), and adverse health effects from urban runoff into ocean waters. The study found "a direct, linear relationship between swimming-associated gastrointestinal illness and the quality of the bathing water," showing a correlation between SSM values and illnesses.[1] In short, the greater the density of indicator bacteria in a single sample, the greater the likelihood of swimming-associated illnesses.

Footnote:
[1] *Santa Monica Bay Beaches Wet-Weather Bacteria TMDL*. Nov. 7, 2002. California Regional Water Quality Control Board, Los Angeles Region. See also Haile, R.W., et al. 1996. "An epidemiological study of possible adverse health effects of swimming in Santa Monica Bay". Prepared for the Santa Monica Bay Restoration Project; and Haile, R.W., et al. 1999. "The health effects of swimming in ocean water contaminated by storm drain runoff." *Epidemiology* 10(4):355-363

Organization Name: California Regional Water Quality Control Board
Document ID: 203
Comment ID: 96

Comment:
"EPA could ...interpret the 1986 bacteria criteria document as recommending the use of SSMs only for decisions related to public health at beaches. Under this interpretation, SSMs would be part of the water quality criteria, but only used for making beach closure and opening decisions. The SSMs would be available for use as an implementation tool for making beach opening and closure decisions but would not be part of the applicable water quality standards."

The Regional Board disagrees with these statements. The SSMs should be part of the water quality standards for both beach closure and opening decisions and for water quality assessments and regulation of discharges. They should not be merely implementation tools for making beach closure and opening decisions given the direct relationship that exists between the density of bacteria in a single sample and the likelihood of contracting a swimming-related illness.

Additionally, removing SSMs from water quality standards will create an inconsistent and confusing situation in California with respect to beach postings by the local health departments versus water quality assessments for water contact recreation beneficial uses by the Regional Board. Based on the results of the Santa Monica Bay epidemiological study, the State legislature incorporated minimum bacteriological standards into the California Code of Regulations (CCR), including standards for total coliform, fecal coliform, and enterococcus. These water quality standards are used for making beach closure and posting decisions by local public health agencies (CCR Title 17, Article 4, section 7985, Bacteriological Standards). If the U.S. Environmental Protection Agency (USEPA) promulgates bacteria criteria for California (excluding the Los Angeles Region) without including a SSM criterion, the following scenario is likely to arise. The local health departments would post beaches with public health warnings when the SSM standards contained in State law are violated. However, if the geometric mean criteria were not exceeded, the Regional Boards would consider the water contact recreation designated use to be fully supported by the existing water quality. So, in spite of the fact that beaches would be posted with health risk warnings, the water quality would not be considered impaired for water contact recreation, and the Regional Board would have no compelling basis to regulate discharges to improve water quality.

Organization Name: California Regional Water Quality Control Board
Document ID: 203
Comment ID: 98

Comment:
"...EPA could interpret the phrase "as protective of human health as" the 1986 criteria document to apply only to the geometric mean. Under this interpretation, EPA would promulgate only the geometric mean in the final rule."

The Regional Board disagrees with this approach given the findings of the Santa Monica Bay epidemiological study, which showed a direct link between single sample bacteria densities and increased risk of swimming-related illness. We believe that USEPA must interpret "as protective of human health as" the 1986 bacteria criteria document to include both SSM and geometric mean criteria.

Organization Name: California Regional Water Quality Control Board
Document ID: 203
Comment ID: 104

Comment:
From a public health perspective,[4] adopting conservative water quality standards that include SSMs is the responsible approach until there is definitive evidence that water quality meeting geometric mean objectives alone will fully support contact recreation beneficial uses. The interests of the people of our nation are best served by limiting the possibility of illness due to water contact recreation. The two-tiered approach of SSM and geometric mean objectives should be retained by the USEPA in its final rulemaking.

While the Los Angeles Regional Board supports the use of both SSM and geometric mean limits in setting bacteria water quality standards, the California State Water Resources Control Board (State Board) is proposing to amend the bacterial water-contact standards in the California Ocean Plan to remove SSM objectives and use SSM limits as merely triggers for additional monitoring. The State Board will consider the proposed amendment to the California Ocean Plan in October 2004 and, if adopted, will seek US EPA approval of the plan. The Los Angeles Regional Board is

opposed to this change to the California Ocean Plan because, for the reasons discussed in this letter, it is not as protective as the USEPA recommended 1986 criteria and is inconsistent with related State law.

Footnote:
[4] "In 2002, a study by the Centers for Disease Control and Prevention concluded that the incidence of infections associated with recreational water use has steadily increased over the last several decades. The increase is attributed to both better reporting and an actual increase in the number of people becoming ill:" Natural Resources Defense Council. *Testing the Waters 2003: A Guide to Water Quality at Vacation Beaches.*

Organization Name: California Regional Water Quality Control Board, San Diego Region
Document ID: 199
Comment ID: 108

Comment:
Use of Single Sample Maximum

"One interpretation is that [SSM] is a single value never to be exceeded."

The Regional Board agrees that this is a valid definition that should be used for both beach closure and opening decisions and for water quality assessments and regulation of discharges. The main opposition to the inclusion of SSMs in water quality standards appears to be the high day-to-day variability in bacteria density in single samples. Nonetheless, a direct correlation exits between the density of bacteria in a single sample and the likelihood of contracting a swimming-associated illness. The Santa Monica Bay Restoration Project epidemiological study found that swimming in waters contaminated by urban runoff increases the risk for coughing with phlegm, vomiting, ear discharge, chills, and significant respiratory diseases (fever and nasal congestion, fever and sore throat, etc). The study analyzed the relationship between the total-to-fecal coliform ratio, previously studied bacterial indicators (total coliform, fecal coliform, *E. coli*, and enterococcus), and adverse health effects from urban runoff into ocean waters. The study found "a direct, linear relationship between swimming-associated gastrointestinal illness and the quality of the bathing water," showing a correlation between SSM values and illnesses.[1] In short, the greater the density of indicator bacteria in a single sample, the greater the likelihood of swimming-associated illnesses.

Footnote:
[1] *Santa Monica Bay Beaches Wet-Weather Bacteria TMDL.* Nov 7, 2002, California Regional Water Quality Control Board, Los Angeles Region.

Organization Name: California Regional Water Quality Control Board, San Diego Region
Document ID: 199
Comment ID: 111

Comment:
"SSMs would be part of the water quality standard, but only for making beach closure and opening decisions."..."The SSMs would be available for use as an implementation tool for making beach opening and closure decisions but would not be part of the applicable water quality standards."

The Regional Board disagrees with these statements. The SSMs should be part of the water quality standards for both beach closure and opening decisions and for water quality assessments and regulation of discharges, not merely implementation tools for making beach closure and opening decisions, because a direct relationship exists between the density of bacteria in a single sample and the likelihood of contracting a swimming-related illness.

Additionally, excluding SSMs from the standards for water quality assessments will create an inconsistent and confusing situation in California with respect to beach closings by the local health departments versus water quality assessments for contact recreation beneficial uses by the Regional Board. The California Code of Regulations (CCR) contains SSMs for all three bacterial indicators as part of the water quality standards for making beach closure and opening decisions by local public health agencies (CCR Title 17, Article 4, section 7985, Bacteriological Standards). If the U.S. Environmental Protection Agency (USEPA) promulgates the criteria without SSMs as part of water quality standards for assessments, during wet weather conditions, the following scenario is likely to arise. The local health departments would close beaches when the SSM standards are violated. However, if the geometric mean criteria are not exceeded, the Regional Board would consider contact recreation beneficial uses to be fully supported by the existing water quality. So, in spite of the fact that beaches would be closed and posted with health risk warnings, the water quality would not be considered impaired for contact recreation, and the Regional Board would have no compelling basis to regulate discharges to improve water quality.

Organization Name: California Regional Water Quality Control Board, San Diego Region
Document ID: 199
Comment ID: 112

Comment:
"...EPA could interpret the phrase 'as protective of human health as' the 1986 criteria document to apply only to the geometric mean."

The Regional Board disagrees. We believe that USEPA must interpret "'as protective of human health as' the 1986 bacteria criteria document" to include both SSMs and geometric means for all water quality criteria.

Organization Name: California Regional Water Quality Control Board, San Diego Region
Document ID: 199
Comment ID: 114

Comment:
"...EPA would promulgate only the geometric mean in the final rule."

The Regional Board disagrees. Based on the above discussion, SSMs should be promulgated in the final rule along with geometric means.

Organization Name: California Regional Water Quality Control Board, San Diego Region
Document ID: 199
Comment ID: 124

Comment:
From a public health perspective,[4] adopting conservative water quality standards that include SSMs is the responsible approach until there is definitive evidence that water quality meeting geometric mean objectives alone will fully support contact recreation beneficial uses. The

interests of the people of our nation are best served by limiting the possibility of illness due to water contact recreation. The two-tiered approach of SSM and geometric mean objectives should be retained by the USEPA in its final rule-making.

This approach is in opposition to a proposal by the California State Water Resources Control Board (State Board) to amend the bacterial water-contact standards in the California Ocean Plan. The State Board's proposed amendment re-defines the single sample maximum standard values to be triggers for additional monitoring rather than part of regulatory standards. The State Board will consider the proposed amendment to the California Ocean Plan in October 2004, and if adopted will seek USEPA approval of the plan. The Regional Board is opposed to this change to the California Ocean Plan because, for the reasons discussed in this letter, it is not as protective as the USEPA 1986 criteria.

Footnote:
[4] "In 2002, a study by the Centers for Disease Control and Prevention concluded that the incidence of infections associated with recreational water use has steadily increased over the last several decades. The increase is attributed to both better reporting and an actual increase in the number of people becoming ill." Natural Resources Defense Council. *Testing the Waters 2003: A Guide to Water Quality at Vacation Beaches.*

Organization Name: California Stormwater Quality Association
Document ID: 202
Comment ID: 129

Comment:
Issue: Definition or explicit interpretation of the term "single sample maximum"

The 1986 bacteria criteria document does not interpret the meaning of the term "single sample maximum." USEPA is seeking public comment on whether to include an explicit interpretation or definition of this term in the final regulatory text. Possible interpretation options include:

a. The single value is never to be exceeded;

b. Allow for exceedance of the SSM when making attainment decisions because bacterial measurements are inherently variable, due to a number of factors that may not necessarily reflect underlying water quality. An unacceptably high value for any given individual sample may be used to trigger a beach advisory or closing or additional monitoring or it may be evaluated with other sample results, but would not necessarily be used alone to determine nonattainment of the water quality standards;

c. SSMs would be part of the water quality criteria, but only used for making beach closure and opening decisions. States could use only the geometric mean for other CWA purposes (NPDES permitting, TMDLs, etc.).

If the SSM is to be included in the final criteria then CASQA supports an explicit interpretation of the term "single sample maximum." Based on our experience we support the interpretation noted in item b above. Our experience in California, especially with southern California beaches, is that the use of a single value for making attainment decisions is inadequate at best and erroneous at worst. The sporadic, episodic, and variable nature of bacteria violations in the surf zone makes the use of single values for attainment issues unreasonable.

Organization Name: California Stormwater Quality Association
Document ID: 202
Comment ID: 131

Comment:
Issue: Use of Geometric Mean "as protective of human health"

USEPA is considering the interpretation of the phrase "as protective of human health as" in the 1986 bacteria criteria document to only apply to the geometric mean. Similarly the SSM would be available for use as an implementation tool for making beach opening and closure decisions but would not be part of the applicable water quality standards. States would have flexibility to use the SSMs in this or any other application of the water quality standards, as they deem appropriate. CASQA supports this interpretation for a couple of reasons. First as stated in the proposed rule, USEPA in its epidemiological studies on coastal and Great Lakes waters used the geometric mean as the value to correlate with average gastrointestinal illness rate. Thus the use of a geometric mean has a more direct correlation with the intended purpose of the proposed rule. Second, the SSMs should be used more for identifying problematic water bodies and not for compliance assessment. Rather the SSMs should be used in the water quality standard implementation process. Should USEPA decide to include SSMs in the final criteria then CASQA supports the opportunity for each State to develop their own site specific SSMs. Current monitoring efforts in California provide a significant database for the development of SSMs that reflect local conditions and uses.

Organization Name: County of Orange, CA/RDMD/Watershed and Coastal Resources Division
Document ID: 193
Comment ID: 178

Comment:
The term "single sample maximum" should be interpreted as meaning: allowance of exceedence of the SSM when making attainment decisions because bacterial measurements are inherently variable, due to a number of factors that may not necessarily reflect underlying water quality. An unacceptably high value for any given individual sample may be used to trigger a beach advisory or closing or additional monitoring or it may be evaluated with other sample results, but should not be used alone to determine nonattainment of the water quality standards.

Organization Name: County of Orange, CA/RDMD/Watershed and Coastal Resources Division
Document ID: 193
Comment ID: 179

Comment:
The interpretation of the phrase "as protective of human health as" from the 1986 bacteria criteria document should be applicable only to the geometric mean. Under this interpretation EPA would promulgate only the geometric mean in the final rule, and the SSMs would be available for use as an implementation tool for making beach opening and closure decisions but would not be part of the applicable water quality standards.

Organization Name: Department of Environmental Services City and County of Honolulu
Document ID: 235
Comment ID: 298

Comment:
Section 131.41(c)(2)

We feel that single sample maximum (SSM) values should not be part of the WQS because the values were not determined from data taken from Hawaiian waters. The SSM values perhaps could be used to serve as triggers for beach closures or additional sampling. In this case, defining "coastal recreation water" categories would not be necessary.

Organization Name: Florida Department of Environmental Protection
Document ID: 229
Comment ID: 76

Comment:
We agree that the phrase "as protective of human health as" the 1986 criteria document applies only to the geometric mean. The department's data indicate that the majority of determinations of impairment are attributable to exceedences of the geometric means, while natural variability is highly likely to cause exceedences of the Single Day Maxima. We encourage EPA to promulgate only the geometric mean in the final rule. The Single Sample Maxima are available as implementation tools for making beach opening and closure decisions but should not be part of the applicable water quality standards. The department is compiling our data in support of this recommendation and will submit the information in the next couple of weeks.

Organization Name: Florida Department of Environmental Protection
Document ID: 229
Comment ID: 77

Comment:
In Florida we have used the term "single sample maximum" to imply a level not to be exceeded. However, the enterococci and *E. coli* single sample maxima in the 1986 criteria document are percentiles of the range of data that went into deriving the geometric mean. Therefore, it is reasonable to expect that these single sample maxima will be exceeded proportionate to their percentile rank. We believe the best use of the single sample maxima limits in the 1986 criteria document will be as recreation advisory levels not as water quality criteria.

Organization Name: Hampton Roads Sanitation District
Document ID: 220
Comment ID: 228

Comment:
While the proposed rule does not apply to Virginia because it has already adopted the 1986 proposed criteria including the use of single sample maximum concentrations (SSM), the application of the SSM is causing an increase in the number of beach closings and potential listing of waters as impaired under 303(d).

HRSD believes strongly that any of the options that rely on SSM concentrations for regulatory decisions are inappropriate due to normal variability of results due to bacterial analytical methods and sampling.

Organization Name: Hampton Roads Sanitation District
Document ID: 220
Comment ID: 233

Comment:
EPA should promulgate only the geometric mean of bacterial density in the final rule. SSMs would be available for use as an implementation tool for making beach opening and closure decisions, but would not be part of the applicable water quality standards.

Organization Name: Jeffrey A. MacDonald
Document ID: 177
Comment ID: 50

Comment:
Issue - Use of a Geometric Mean (GM) or a Single Sample Maximum (SSM) when applying an *E. coli* standard to a WPDES holder.

A portion of the proposed rule reads, "...the geometric mean has the most direct relationship to the illness rate. With this in mind, EPA could interpret the phrase "as protective of human health as" the 1986 bacteria criteria document to apply only to the geometric mean...The SSMs would be available for use as an implementation tool for making beach opening and closure decisions but would not be part of the applicable water quality standards."

Since the GM is more directly tied to illness rate than is a SSM, it would be appropriate to use only the GM for regulation of NPDES holders. The SSM should only be used in beach opening and closing decisions. I strongly recommend regulation solely by a geometric mean, with no single sample maximum in the regulation for NPDES permit holders. It is beneficial to have a large data set when developing a geometric mean for NPDES permit monitoring. Sampling three times per week for small-to-moderate dischargers, and daily for large dischargers (>10 million gallons per day), would be reasonable frequencies for calculating monthly GMs.

Organization Name: Kansas Department of Health and Environment, Division of Environment, Bureau of Water
Document ID: 173
Comment ID: 197

Comment:
Use of Single Sample Maximum - EPA requested input on alternatives for using single sample maximum (SSM) criteria. KDHE would suggest a hybrid approach incorporating elements of two of the proposed alternatives. The hybrid would provide for SSMs that could be used for beach closures, **and** allow to states to choose whether to use the SSMs for use attainability decisions for 305b and 303d purposes. The current proposals state that 1) *only* a geometric mean could be used for Clean Water Act purposes; or 2) SSMs would be "*available as an implementation tool.*" The first alternative eliminates state's ability to use SSMs for attainability and permitting decisions. The second implies the SSM would not be regulatory in nature, thus making it questionable if it would be enforceable in determining impairment.

The hybrid would allow the SSMs to be regulatory in nature for beach closures, while leaving up to state to determine whether to use SSMs for attainability decisions. The hybrid would also provide maximum flexibility for state implementation.

Organization Name: King County Department of Natural Resources and Parks
Document ID: 158
Comment ID: 267

Comment:
We at King County in Washington State have significant concerns about this action and want to comment on the options EPA are considering. In each part of the rule EPA is asking for comment on has significant issues, not the least of which is the application of a single sample maximum along with a geomean. For any utility or municipality in the midst of long term control plan for CSOs, it can be assured that for a few hours periodically, there will be opportunities to exceed the standards being proposed. Such exceedances would lead to listing of waterbodies and TMDLs solely on the exceedance of that single daily maximum. This is not wise policy or appropriate use of EPA's override of state delegated' authority, particularly when the states will be the ones that will have to prepare the TMDLs such actions would necessitate.

Organization Name: Maryland Association of Municipal Wastewater Agencies
Document ID: 201
Comment ID: 27

Comment:
First, we are opposed to EPA mandating the adoption of the upper percentile values in the 1986 criteria document. We believe the geometric mean is the appropriate regulatory requirement. We have used geometric means solely here in Maryland for years. We are not opposed to EPA authorizing states to choose and use upper percentile values where data to calculate the geometric mean are not available or where the UPVs are used in an advisory (i.e., non-regulatory) capacity.

Organization Name: Maryland Association of Municipal Wastewater Agencies
Document ID: 201
Comment ID: 28

Comment:
Second, regardless of what standard EPA chooses to impose in the final rule, EPA should follow its November 2003 guidance and make clear that for attainment, TMDL, and NPDES permitting purposes, only the geometric mean should be applied (again, where there is at least four samples during each month). Again, we have used only a geometric mean for years in our discharge permits and have never had a problem.

Organization Name: Massachusetts Department of Environmental Protection
Document ID: 208
Comment ID: 60

Comment:
The single sample maximum (SSM) should be used for operational decisions involving beaches, but not in assessments of other ambient waters. Only the swimming season geometric mean should be used for assessing non-beach waters.

Organization Name: Massachusetts Water Resources Authority
Document ID: 245
Comment ID: 174

Comment:
The geometric mean is a better water quality attainment measure than a Single Sample Maximum (SSM) in coastal recreational waters. The SSMs are based on arbitrary percentiles of the distribution of the study population(s). MWRA is unaware of any epidemiological evidence

supporting these percentiles. Therefore, the least restrictive use and interpretation of these SSMs is appropriate. The geometric mean, as a measure of central tendency, is a more accurate indicator of water quality because bacteria concentrations can be highly variable in the environment. SSMs are short term measures of water quality, and provide appropriate guidance for rapid responses that serve public health - triggering beach advisories, closing, additional monitoring, or further evaluation, depending on the use category. If SSMs were included as a water quality attainment measure, CWA violations would likely increase, creating the public perception that water quality had degraded. This perception undermines treatment improvements that have already been implemented or planned at significant cost to meet existing standards. For water body assessments and TMDLs, the criterion should be limited to the geometric mean. It is imperative that EPA makes it clear to States that the SSM should be used as a recreational water quality guideline and NOT be used as a water quality attainment measure.

Organization Name: Massachusetts Water Resources Authority
Document ID: 245
Comment ID: 177

Comment:
The most troubling implication of this proposed rule is that if enterococcus and *E. coli* are adopted as water quality criteria for recreational waters, these standards will be incorporated into "DES discharge permits as is, without further consideration of applicability to wastewater treatment. This is of great concern because it has not been demonstrated that all treatment facilities will be able to comply these new standards, particularly the SSM. The SSM should only be used as a recreational water guideline and not as a water quality attainment measure. Maximum flexibility should be allowed in implementation of these proposed criteria, with emphasis placed on their effective use as recreational water guidelines and not as discharge limits for wastewater until the wastewater treatment of enterococcus is better understood.

Organization Name: Milwaukee Metropolitan Sewerage District
Document ID: 196
Comment ID: 185

Comment:
Regarding the promulgation of a **"single sample maximum"**, we strongly urge against the interpretation of such as standard as a single value never to be exceeded. As noted in the preamble to the proposed rule, bacterial measurements are inherently variable, due to a number of factors not necessarily reflective of underlying water quality. Since the GM is more directly tied to illness rate than is a SSM, it would be appropriate to use only the GM for regulation of WPDES holders. The SSM should only be used in beach opening and closing decisions. We strongly recommend regulation solely by a geometric mean, with no single sample maximum in the regulation for WPDES permit holders. Therefore, we urge you to promulgate a final rule which contains only a geometric mean; making the SSMs available for use as an implementation tool possibly for making beach opening and closure decisions, but not a part of applicable water quality standards.

Organization Name: NRDC, Clean Water Project
Document ID: 192
Comment ID: 209

Comment:
Integrating WQS into NPDES Permits

The BEACH Act anticipated that relevant criteria would be integrated formally into the Clean Water Act's regulatory system. A plain reading of statutory text outlines that BEACH Act water quality standards merely amend those provided for in described in sections 302 and 303 of the Clean Water Act. 33 U.S.C. at 1312, 1313. EPA's guidance on this issue, as put forth in the *Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, requires that the permitting authority develop permits designed to attain water quality standards. *Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, at 5.2.1; see 40 C.F.R. 122.44 (d). While this statement is consistent with the Clean Water Act, the guidance suggests elsewhere that states have ultimate discretion as to how water quality standards will be attained. Id. at 5.2.2. Given uncertainty within the regulated community, this guidance does not provide adequate clarification that all NPDES permits authorizing discharges into waters covered by the BEACH Act must ensure compliance with the new bacterial standards, including through setting water-quality based effluent limits when necessary to achieve compliance. We ask EPA to inform clearly the regulated community, including publicly owned treatment works, of their obligation to meet these water quality standards.

Organization Name: National Council for Air and Stream Improvement, Inc.
Document ID: 189
Comment ID: 43

Comment:
Finally, NCASI is concerned about the potential use of single sample maximum (SSM) values for determining the status of waters relative to impairment listing under Clean Water Act section 303(d). As expressed in the proposed rule, the purpose of SSM values is as a guide for protecting the health of those using recreational waters. While the use of single water quality measurements is appropriate for the protection of human health, it is clearly inadequate for assessing the spatial and temporal quality of a water body. This is particularly true for bacterial indicator assays because the degree and extent of contamination can be very localized in time and space. The proposed rule should clarify that the geometric mean is the more appropriate value against which water impairment should be judged, and that multiple samples will be needed to adequately characterize the spatial and temporal variation needed to interpret the impairment status of water.

Organization Name: New Jersey Department of Environmental Protection
Document ID: 178
Comment ID: 18

Comment:
The interpretation of "single sample maximum" as a single value never to be exceeded (p. 41725; 1st column).

For waters having Geometric mean (Gm) values equivalent to the acceptable Gm, the single sample maximum (SSM) numbers are exceeded 25%, 18%, 10% or 5% of the time depending upon which SSM value is used (*i.e.*, the 75%, 82%, 90%, or 95% value). So, the above interpretation hardly seems appropriate. NJ never makes a beach closure decision based on a single exceedence of an SSM value. Such an exceedence is used as a trigger for additional monitoring.

Organization Name: New Jersey Department of Environmental Protection
Document ID: 178
Comment ID: 20

Comment:
The use of single sample maximum (SSM) values only for beach closure and opening decisions.

New Jersey supports this approach. There are only 2 occasions when SSM values are useful. One, when there is an "immediate" need to know whether or not the sanitary quality of a water body is acceptable. That is, a regulatory body does not have time to wait 30 days to collect 5 or more equally-spaced samples to determine whether or not it is safe to swim. The only situation where immediate decisions are required is at regulated (*i.e.*, lifeguarded) beaches. At regulated beaches, the regulating authority must establish each day, few days or each week whether or not the sanitary quality of the bathing water is acceptable. The second case is when there is not enough data from a given location (< 5 samples over 30 days) to calculate a Gm. For all other Clean Water Act purposes, SSM values are not needed. Thus, SSMs should be specified (but see below) for beach closure decisions, and perhaps listed as "guidance values only" for locations, which do not have sufficient data to calculate a valid Gm. **Only the Gm can and should be the basis of an applicable water quality standard.**

Organization Name: North Carolina Dept. of Environment and Natural Resources
Document ID: 190
Comment ID: 465

Comment:
Single Sample Maximum (SSM)

The State supports removal of the single sample maximum (SSM) from the EPA proposed water quality criteria. We believe strongly in the use of a single sample maximum when making rapid or short-term decisions related to public health at beaches and have placed the SSM in current NC public health regulations. We believe that the BEACH Act "as protective of human health as" applies *only to the geometric mean* as defined in the 1986 Ambient Water Quality Criteria for Bacteria document. The State of North Carolina additionally supports the use of a geomean to determine NPDES permitting, TMDLs and waterbody assessments that require management responses over an extended period of time.

We understand the single-sample maximum (SSM) statistical approach to estimate the geomean compliance, but believe that the use should be limited to management decisions for coastal recreation beach advisory programs *and not applied as a water quality standard.* We understand EPA is currently promulgating a water quality standard in NC to be compliant with the BEACH Act. However, we request acknowledgement that our "Coastal Recreational Waters Monitoring, Evaluation, and Notification" regulations (15A NCAC 18A .3400) adequately address the single sample maximum (SSM) issues and that there be no SSM within the promulgated standard.

Organization Name: North Carolina Dept. of Environment and Natural Resources
Document ID: 190
Comment ID: 481

H-4-260

Comment:
Nonetheless, we support the use of a central tendency statistic rather than a single sample maximum for bacterial water quality standards.

Organization Name: Northeast Ohio Regional Sewer District
Document ID: 198
Comment ID: 304

Comment:
Due to the magnitude of the implications for POTWs including the NEORSD, the NEORSD's comments focus on the interpretations of the term "single sample maximum" ("SSM") as they appear in Section III.B.1 of the proposed rule's preamble. Specifically, we cannot more strongly disagree with the first interpretation presented in the preamble and selected for the proposed rule interpreting that the SSM is to be applied as "a single value never to be exceeded." This interpretation creates an unreasonable standard for many waters because:

- Adoption of a never-to-exceed SSM is more protective than mandated;
- Adoption of a never-to-exceed SSM would discourage more extensive sampling and have the unintended effect of reducing the level of protection;
- Criteria Document statements do not necessitate never-to-exceed SSM adoption.
- The EPA cost analysis greatly underestimates the proposed rule's impact;
- The State of Ohio's existing *E. coli* criteria are at least as protective as the Federal criteria.

Furthermore, full attainment of the standard is impossible in the vicinity of upstream combined sewer overflows ("CSOs") or any significant urban or agricultural runoff. Elaboration on each of the above comments is presented below and in the attachments.

Adoption of a never-to-exceed SSM is more protective than mandated.

The Beaches Environmental Assessment and Coastal Health Act of 2000 ("BEACH Act") mandates that States adopt water quality criteria and standards "that are as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator..." (Paragraph (i)(1)(A) of Section 2). The relevant consideration for determining consistency of State criteria with Federal criteria under the BEACH Act is therefore the level of risk to human health.

In *Ambient Water Quality Criteria for Bacteria* - 1986 ("Criteria Document"), EPA established an acceptable level of risk to human health for freshwater at a swimming associated gastrointestinal illness rate of 8 per 1,000 swimmers. The Criteria Document associated this illness rate with a geometric mean *E. coli* density of 126 per 100 mL. Also published in the Criteria Document were values termed "one-sided confidence limits" that, according to the document, "no sample should exceed." However, as explained below and demonstrated in Attachment A, when applied as a SSM never to be exceeded, these values are indicative of levels of risk to human health that are lower than the acceptable level of risk established in the Criteria Document.

For example, consider that the 75 percent "confidence limit" in the Criteria Document represents the value which 25 samples would be expected to exceed in a 100-sample data set with a geometric mean at the acceptable illness rate. To establish that this value is never to be exceeded is to deem as unacceptable those highest 25 samples collected at the acceptable illness rate. Excluding those 25 samples shifts the geometric mean downward to a value lower than the

geometric mean associated with the acceptable illness rate established in the Criteria Document. (Attachment A includes this evaluation.) Thus, adopting the SSM as a value never to be exceeded even in a large data set would be more protective than the human health risk-based geometric mean criteria and more protective than could have been envisioned by the Criteria Document authors. Adoption of the SSM as a value never to be exceeded is therefore not mandated by the BEACH Act requirement for State criteria "as protective" as EPA-published criteria.

Organization Name: Northeast Ohio Regional Sewer District
Document ID: 198
Comment ID: 305

Comment:
Adoption of a never-to-exceed SSM would discourage more extensive sampling and have the unintended effect of reducing the level of protection..

In support of a preference for applying the geometric mean criteria when implementing a risk-based approach for protecting human health, the Criteria Document states unambiguously, "It is the long-term geometric mean bacterial density that is of interest. Because of day-to-day fluctuations around this mean, a decision based on a single sample (or even several samples) may be erroneous, i.e., the sample may exceed the recommended mean criteria even though the long-term geometric mean is protective, or may fall below the maximum even if this mean is in the nonprotective range."

Adopting the SSM as a value never to be exceeded could, in practical implementation, have the undesired effect of discouraging the collection of sufficient samples to calculate a representative geometric mean - the indicator of human health risk acknowledged by EPA to be much superior to individual values from single samples. A State or local agency concerned about resource constraints could well ask, "Why collect five or more samples in a month when a single sample in a month is sufficient to determine attainment of the adopted standard?" Considering the Criteria Document's variability caution quoted above, adopting the SSM as a value never to be exceeded might thus, in many circumstances, result in <u>less protection</u> of human health.

Another instance of diminished human health protection likely to result from adoption of the SSM as a value never to be exceeded is described in Attachment B. The NEORSD is engaged in research intended to progress toward a predictive model to better protect the health of swimmers at local beaches. One aspect of this work, related to wave action and bacteria release from the sand, requires intensive sampling during periods when bacteria levels are anticipated to be high. Application of the SSM as a value never to be exceeded has unfortunate implications for this work. A final rule with this provision would penalize this work and discourage the very objective of public health protection that is the driving force behind both the standard and our current research. Therefore, in the interest of better providing protection for public health by not discouraging research, the proposed application of the SSM as a value never to be exceeded should be deleted from the final rule.

Organization Name: Northeast Ohio Regional Sewer District
Document ID: 198
Comment ID: 306

Comment:
Finally, adoption of the SSM as a value never to be exceeded could necessitate the selection of sewer separation for CSO control as the only long-term control plan option assuring that CSOs

are not causing or contributing to the SSM being exceeded. This would, however, have the unintended effect of increasing the risk to public health. NEORSD studies have shown that sewer separation produces a total annual loading of bacteria and other pollutants to receiving waters that exceeds that resulting from other CSO control options. Much of the combined sewers' capture for treatment of storm water, also a major source of these pollutants, is lost through sewer separation's elimination of the combined sewer system. Pollutant loads that would have received treatment in a combined system are instead conveyed through separate storm sewers directly to the receiving waters without treatment. Because a resultant increase in total *E. coli* loading would produce an increase in the geometric mean *E. coli* density in the receiving waters, the associated human health risk would also increase.

Criteria Document statements do not necessitate never-to-exceed SSM adoption.

The Criteria Document states, "Noncompliance with the criterion is signaled when the maximum acceptable geometric mean is exceeded or when any individual sample exceeds a confidence limit, chosen accordingly or to a level of swimming use." A conclusion - notwithstanding the above-expressed concerns regarding level of human health protection - that this statement nonetheless necessitates adoption of SSMs as values never to be exceeded would be a misinterpretation.

A "signal" is typically defined as "something that incites to action" and "something that conveys notice or warning." The "action" incited could be an increase in sampling frequency or a beach closure; the "notice or warning" conveyed could be a beach advisory to avoid swimming. Considering the well-recognized extreme variability of bacteria levels in surface waters, such applications would be much more appropriate uses of the SSM than its adoption for determination of standards attainment under the Clean Water Act. The use of the term "signaled" is not synonymous with the term "determined" here. State adoption of the SSM as a value never to be exceeded for determining water quality standards attainment is not mandated by this statement in the Criteria Document.

Organization Name: Pennsylvania Department of Environmental Protection
Document ID: 233
Comment ID: 248

Comment:
Multiple issues, such as potential cut-offs or other considerations to address wet weather limitations on interpretation of bacterial impairments of uses, are important aspects in promulgating the criteria. Individual states and interstate agencies, such as the Ohio River Water Sanitation Commission (ORSANCO), are struggling to find workable means to account for the effects of weather conditions on bacteria densities, and this proposal ignores these important issues. Applying these regulations could have unintended results, extending the number of apparent impairments to waters; rather than provide a tool to more accurately account for real world conditions. Listing waters as impaired necessitates development of TMDLs, a resource-intensive task that diverts precious dollars from real problems.

Organization Name: Pennsylvania Department of Environmental Protection
Document ID: 233
Comment ID: 256

Comment:
Among the options for adoption of forms of the criteria, we believe that the geometric mean is the best expression of the criteria to be used in attainment of use decisions. Furthermore, because nonattainment is a long-term condition, we believe that long-term data are necessary to make that decision. We, therefore, support use of at least one full swimming season - in Pennsylvania that means six months - of data to judge that attainment. The geometric mean is also most useful in developing NPDES permitting limits, and the 1986 bacteria criteria document used the seasonal geometric mean as the basis for the correlation to the criterion.

We support not adopting the single sample maximum (SSM) as part of the DEP water quality standards for the state. The maximum or SSM value has merit for immediate, short-term decision making relating to opening or closing a beach on a particular day, and is appropriately adopted into the DOH beach regulations. PA DEP supports the approach where SSMs would be used to trigger decisions on beach advisories or closings or additional monitoring, but would not be used alone to determine nonattainment of the water quality standards. SSMs should be limited for use as an implementation tool for making decisions on beach advisories, closings, and additional monitoring.

If, however, single-sample maximums are including in the promulgation as part of the water quality standards, it must be clearly identified as to how the SSMs are to be used for beach-related decision making, only.

Organization Name: South Carolina Department of Health and Environmental Control Bureau of Water
Document ID: 161
Comment ID: 218

Comment:
Issue: The use of single sample maximums (SSMs) in water quality standards and their implementation.

The language used by the EPA in this notice is far different from that used previously in the draft implementation guidance. From this notice, it appears that the EPA is saying the SSMs should not be used in permitting activities, but only as a measure for beach closures. This is completely contrary to the way this issue has been discussed by the EPA previously. We maintain that the bacteria standard should have two parts: a geometric mean to be used as a chronic number in water quality programs and an SSM to be used as an acute number.

Organization Name: South Carolina Water Quality Association
Document ID: 200
Comment ID: 15

Comment:
First, we are opposed to EPA mandating the adoption of the upper percentile values in the 1986 criteria document. We believe the geometric mean is the appropriate regulatory requirement. We are not opposed to EPA authorizing states to choose and use upper percentile values where data to calculate the geometric mean are not available or where the UPVs are used in an advisory (i.e., non-regulatory) capacity.

Organization Name: South Carolina Water Quality Association
Document ID: 200
Comment ID: 17

Comment:
Second, regardless of what standard EPA chooses to impose in the final rule, EPA should follow its November 2003 guidance and make clear that for attainment, TMDL, and NPDES permitting purposes, only the geometric mean should be applied (again, where there is at least four samples during each month).

Organization Name: State of Alaska Department of Environmental Conservation/Division of Water
Document ID: 175
Comment ID: 154

Comment:
Proposed Criteria for Pathogen Indicators: Use of the Single Sample Maximum.

EPA requests comments on use of the geometric mean (GM) and single sample maximum (SSM) values. While EPA is proposing to promulgate criteria in both GM and SSM terms, we suggest that the 1986 data and analysis will only support an actual criterion expressed as a GM. As the discussion points out, the 1986 criteria document discusses SSMs solely in the context of beach closures and not in terms of establishing water quality standards. Consequently, the rule should include a specific criterion expressed as a GM for the purpose of assessing attainment with water quality standards and for taking Clean Water Act (CWA) actions such as issuing permits or developing Total Maximum Daily Loads (TMDLs). The rule might also allow states to incorporate SSM values into their criteria or as a basis for making beach closure decisions at their discretion. We suggest that this approach represents the most accurate interpretation of the 1986 guidance.

Organization Name: State of Connecticut Department of Environmental Protection
Document ID: 244
Comment ID: 161

Comment:
With regard to interpretation of the single sample maximum criterion (SSM), Connecticut strongly endorses the alternative option proposed: allowance for exceedance of the SSM when making attainment decisions. The SSM represents a statistically derived upper confidence limit on a steady-state geometric mean value associated with a stated risk of illness. For this reason, there should be a recognition incorporated into the assessment process that individual sample results will exceed this value. For high use areas, the frequency of excursions due to expected variability in the sampling data will be an unacceptably high 25% at monitoring locations where the geometric mean concentration is consistent with the geometric mean criteria. Connecticut supports an interpretation that SSMs would be used only for purposes of making beach closure/opening decisions (for which the SSM is appropriate) and not for assessment purposes (for which the SSM is ill suited).

Organization Name: State of Hawaii Department of Health/Environmental Health Administration
Document ID: 195
Comment ID: 395

Comment:
Geometric mean: Assuming that there must be a geometric mean beyond 300 meters/1000 feet and given that EPA will adopt criteria for Hawaii, DOH does not propose different enterococcus criteria from EPA's proposal of 33 CFU/100 ml for inland waters and 35 CFU/100 ml for open coastal or oceanic waters. DOH refers to its comments on waters to be covered, item 3 above, and to the attached response to public comments on the proposed DOH rules.

Organization Name: State of Hawaii Department of Health/Environmental Health Administration
Document ID: 195
Comment ID: 397

Comment:
Single Sample Maximum status:

We favor using a SSM as part of a water quality standard rule, and not just for decision making or as an implementation tool. DOH reserves its right to use secondary or supplemental indicators and other factors in making decisions.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 348

Comment:
Single sample maximums should not substitute for use of the geometric mean.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 349

Comment:
Single sample maximums should represent their related frequency of occurrence.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 365

Comment:
In addition to the likelihood that the geometric mean criteria are faulty for our state, the use of a confidence level to represent a single sample maximum is problematic. Statistically, if the data set used to derive the standard deviation is correct then the selection of a confidence interval to represent the single sample maximum ensures that with sufficient data collection even a site meeting the geometric mean will eventually have a sample collected that violates the single sample maximum. EPA is creating a 5 to 25 percent chance that an individual sample would be viewed in violation when, in fact, the water body is actually in compliance with the geometric mean. A single sample limit should only be included for use where the sample data set includes less than 10 samples. Were the data set is greater than 10 samples, then it would be appropriate to establish a 10 percent exceedence rule. For example, our freshwater standards read "Fecal coliform organism levels must not exceed a geometric mean value of 50 colonies/l00 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points

exist) obtained for calculating the geometric mean value exceeding 100 colonies/100 mL." This approach incorporates the statistics in a simplified and manageable manner directly in the compliance evaluation.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 369

Comment:
Criteria should be designed to encourage monitoring sufficient to calculate the geometric mean, rather than to discourage it. The current proposal as well as many of the alternatives presented in this discussion does just the opposite. Any state that wants to minimize 303(d) listings and other compliance issues can rely on just the single sample maximum. With minimal sampling frequency, and some minor state level policies established on exceedence frequencies considered indicative of impaired waters, few (if any) waters would actually need to meet the geometric mean. If the motivation for the federal rule is EPA's concern over the level of protection provided, then the rule must ensure that some standardized level of protection would actually occur consistently between the affected states.

The use of confidence levels as single sample maximum limits is also a flawed concept by itself. Statistically, if a sufficient sampling program occurs, any water body that meets its geometric mean will occasionally exceed the single sample maximums that were based on that waterbody's standard deviation. Triggering a more comprehensive examination would make more sense than to use the single sample for any regulatory purpose. Using the single sample to close beaches would also make a little more sense, but neither closing beaches nor triggering follow-up monitoring is appropriate in rivers or marine waters that flush themselves over periods of less than a day. Until truly rapid analysis methods are established, responding to single sample events the next day makes very little sense. We really need to be looking and reacting to the long-term health of these waters.

An additional issue that has not been demonstrated by EPA is the effect of the high concentration periods on the overall illness rates that occurred over the summer season in their bather studies. It has not yet been demonstrated whether higher daily average bacterial concentrations accounted for most of the illnesses. If they did, then establishing a single sample maximum limit based on the seasonal standard deviation about the geometric mean may not be reasonably protective of public health. The public is probably unaware that the EPA criteria are based on restricting the total illness rate over the summer, rather than providing them with safe water during their visit to the beach. It is troubling that neither the states nor EPA seem to know what the variability in the incidence rates are in association with the EPA criteria. It is very likely that some moderate percentile of the total seasonal samples should also be below the national geometric mean criteria to be able to truly take the position that public health is being adequately protected.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 370

Comment:
The phrase "as protective of human health" needs to be interpreted broadly, but a federal rule needs to ensure that the impact would not be significantly different between affected states. Thus, allowing significant fluctuations in how the geometric mean is applied would be inappropriate. Moreover, the phrase "as protective of human health" needs to recognize how implementation

occurs in individual states. The same number applied in very different ways produces variable levels of protection.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 372

Comment:
The focus should remain on gaining compliance with the geometric mean, and any use of the standard deviation should really be based on ensuring the shape of the distribution. For example, Washington's freshwater bacteria standard is written as follows: "Fecal coliform organism levels must not exceed a geometric mean value of 50 colonies/100mL, with not more than10percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 100 colonies/100 mL." This approach incorporates the statistics in a simplified and manageable manner directly in the compliance evaluation. The state further includes directives to collect and average multiple samples at swimming areas on each visit, and to not average data collected beyond a single season. These steps ensure that most of the time the water will remain within the geometric mean and that healthy water will be provided to our citizens.

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 375

Comment:
Adding to this is the reality that EPA will not be examining every permit. We think that EPA has made an error in judgment in stating their confidence on the use of the single sample maximum criteria. It is less than clear, however, exactly how EPA or a state would be using the 75 or 95 percent confidence level when developing TMDLs or permits. What is the point of compliance? What is the averaging period? Is it based on the 75 percent of the hourly concentrations, daily concentration, or seasonal geometric means?

Organization Name: State of Washington Department of Ecology
Document ID: 243
Comment ID: 444

Comment:
If EPA continues towards finalizing the federal rule, it should restrict the focus only to designated bathing beaches to match the focus of the Beaches Act. EPA itself has opened the door to interpreting their national criteria recommendations as perhaps being applicable only at designated beaches. Consistent with this revised focus, EPA should include more common sense requirements on monitoring and notification as well as on general sanitation programs that reduce the risk of outbreaks. Clean and adequate restrooms, separate bathing areas for toddlers, vending machines with swim diapers, education kiosks on swimmer-to-swimmer disease transmission, etc. are all examples of programs that would likely result in greater overall protection than the current EPA rule will accomplish.

Without specific directives to ensure that adequate sampling would occur, or that the geometric mean would be the focus of state regulatory programs, even the apparent EPA goal of state-to state consistency will not occur in response to this federal rule.

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 404

Comment:
EPA Must Use this Opportunity to Provide a Clear Statement on the Application of the Bacteria Criteria

Almost 20 years after EPA's 1986 criteria were published, this rulemaking will be EPA's best chance to present a clear and consistent explanation of how those criteria are intended to be applied. We are disappointed that after no less than three public comment periods on EPA's implementation guidance and the opportunity of this draft rule, EPA still has not clearly and definitively resolved a number of fundamental questions about these criteria. Give this uncertainty and these delays by EPA, the states have been hindered in their ability to move toward the adoption of these standards. In our view, EPA must use the opportunity of this rulemaking to definitely establish the geometric mean as the regulatory requirement from the 1986 criteria.

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 405

Comment:
"Single Sample Maximums"

At the outset, we are surprised that EPA chose to return to the use of the term "single sample maximum" ("SSM") to describe what we understand the Agency had correctly defined as "upper percentile values" (UPVs) in its November 2003 guidance on implementing the 1986 bacteria criteria.[1] EPA went so far in its 2003 guidance to state that "The 'single sample maximum' was never intended to be a 'value not to be exceeded' when referring to attainment decisions and National Pollutant Discharge Elimination System (NPDES) permitting under the Clean Water Act. Therefore, EPA is dropping the use of the term in favor of the more statistically correct term 'upper percentile value.'"

EPA started its criteria document by calling these values "confidence intervals" in its original Federal Register notice, then "confidence levels" in the actual criteria document, and now has flip-flopped between SSMs and UPVs.

We fail to understand why EPA would not stick with the UPV clarification in today's proposed rule. To prevent further confusion among stakeholders, we urge EPA to stick to its decision to drop the use of the "SSM" term in favor of the exclusive future use of the more "correct term" "UPV."

Footnote:
[1]EPA explained in that guidance: "The term 'upper percentiles" is used in place of "single sample maximum" to more accurately reflect their derivation and more adequately reflect the range of recommended usage of this aspect of EPA's criteria." EPA November 2003 Bacteria Guidance at Section 1.5.

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 406

Comment:
The Beach Act Only Requires the Adoption of the Geometric Mean.

Because the 1986 bacteria criteria were developed around the geometric mean and because the geometric mean has the most direct relationship to the illness rate, the best interpretation of the Beach Act is that only the geometric mean must be promulgated. How, or if at all, states decide to use the UPVs, is purely an implementation policy decision. The UPVs would be available for use as an implementation tool for making beach advisory decisions but would not be part of the applicable water quality standards. States and Territories would have the flexibility to use the UPVs in this or any other application of the water quality standards as they deem appropriate.

This is clearly the most rational approach and the one that we strongly recommend to EPA. The UPVs are simply not suitable for making regulatory decisions in our view. EPA should begin with the geometric mean-only approach and then in the highly unlikely event that there is a demonstrated need to impose the UPVs as a hard value, such an approach could be adopted in a subsequent promulgation.

We note that EPA enjoys broad discretion in interpreting its criteria document. Moreover, there is clearly no statutory requirement to impose UPVs given that sound reasons exist not to. Moreover, Section 304(a)(9) - added by the 2000 Act - expressly gives EPA five years to publish new criteria, "including a revised list of testing methods, as appropriate." This provision clearly authorizes EPA to make any appropriate refinements to the criteria before imposing them by federal rule. Thus, for the purpose of this rule, EPA should require only the geometric mean and leave to a future rulemaking the need to address any issues regarding the UPVS.[2]

Notably, imposing only the geometric mean criterion would provide an incentive requirement to collect more than a single sample. In this respect, such an option c

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 407

Comment:
Any Upper Percentile Values Should Be Advisory Only - With the Possible Exception of Where Data are Lacking

The draft rule proposes that States adopt UPVs (incorrectly referred to as "SSMs"). We are deeply concerned about how EPA intends for states to apply these criteria to:

- Impaired Waters (303(d) Assessment)
- Wasteload Allocations (WLA)
- Total Maximum Daily Loads (TMDL)
- POW, CSO and Stormwater NPDES permits.

EPA's proposed approaches to addressing the UPVs cover the spectrum from not adopting any at all, to leaving site-specific UPVs up to states to adopting a UPV only for designated beach waters.

EPA cannot ignore this critical issue by categorizing it as an "implementation matter" because in many states, EPA's criteria will be applied at the end-of-pipe for POTWs and other regulated sources. For example, Virginia, Maryland, Pennsylvania, the District of Columbia, West Virginia, North and South Carolina all impose EPA's bacteria criteria as end-of-pipe requirements in NPDES permits.

At the outset, using UPVs to make regulatory decisions is highly questionable given the strong likelihood of getting a high value somewhere in every recreational water from time to time. Such localized individual samples are not reflective of the overall water quality of a water body either at that instant or over time. EPA's own criteria document admits that "because of the day-to-day fluctuations around this mean, a decision based on the single sample may be erroneous."

Accordingly, our recommended approach is for EPA to adopt only the geometric mean and then require that enough samples are collected for assessment and NPDES purposes to allow a calculation against the mean. For bathing beaches, EPA could recommend that the UPVs be set by the individual states and used in an advisory manner rather than as the determinative factor

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 408

Comment:
Finally, we agree with EPA that in no case should UPVs be interpreted as "Never to be Exceeded" values for any purpose, except where there is inadequate data to calculate a geometric mean. Even then, the best approach outside of designated beaches should be follow-up monitoring to allow assessment against the geometric mean rather than attaching any regulatory significance to a single high value. The final rule should expressly re-state this critical limitation on the use of any UPVs.

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 409

Comment:
Regardless of the Standards, EPA Should Clarify that the Geometric Mean Should be Used for Attainment and NPDES Purposes

To address the assessment, TMDL, WLA and permitting issues we recommend the following language be included in the final rule:

"Where adequate data are available, only the long-term geometric mean value shall be used for the purposes of

- Assessing attainment of Water Quality Standards
- Developing Total Maximum Daily Loads
- Establishing Waste Load Allocations and
- Developing WQBELs for NPDES permits"

This language is fully consistent with EPA's November 2003 implementation guidance for the bacteria criteria. Among several reiterations of the point in EPA's guidance is the following quote:
"EPA recommends that states and authorized tribes use only the geometric mean component for NPDES water quality-based effluent limits."

Guidance at 4.2.2.

The Commonwealth of Virginia, among other states, has been implementing this type of approach for some time now. The Virginia Department of Environmental Quality has imposed requirements that the UPV is used for NPDES purposes where there is only one sample result but the more accurate geometric mean is used whenever there is enough data to calculate a geometric mean. Virginia DEQ Guidance Memo Number 03-2007, Implementation of Bacteria Standards in VPDES Permits (see http://www.deq.virginia.gov/).

Organization Name: The CSO Partnership
Document ID: 197
Comment ID: 417

Comment:
We are seriously concerned about several aspects of the proposed rule, with our greatest concern being the potential misuse of the SSMs/UPVs. It is essential that EPA either adopt only the geometric means from the 1986 criteria or if the UPVs are also to be included, that they are qualified so that only the geometric mean will be used for attainment, TMDL, and NPDES permitting purposes.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 138

Comment:
Use of the Single Sample Maximum:

EPA is proposing the use of all four single sample maximum (SSM) values in the 1986 bacteria criteria document for the proposed rule. EPA recognizes that many states have issues concerning the interpretation and implementation of SSM values. In advancing the merits of the proposed approach, EPA elaborates on the value and interpretation of SSM, identified four management alternatives, and solicits comments on these options.

(1) Apply as a single sample value never to be exceeded. (Citation from page 41725, Federal Register, Vol. 69, No. 131, July 9, 2004/Proposed Rules)

Comments: As shown on Table 1 for marine waters[1], a geometric mean density of 35 per 100 ml is the enterococci criterion value associated with an acceptable illness rate of 19 per 1,000 swimmers. This table is the basis for the criteria in the proposed rule. Table 1 also shows a series of "single sample maximum allowable density" values at the 75th, 82nd, 90th and 95th percent upper confidence limits (CL). These values are selected arbitrarily, but not necessarily unreasonably, from the probability (frequency of occurrence) distribution for enterococci, which EPA derived for the illness rate based on field data. This distribution is shown on Figure 1. The single sample maximum values shown on Table 1 are intended to indicate that non-compliance with the

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geometric mean is "signaled" by an unacceptably high value for any "single bacterial sample," the value of which is related to intensity of recreational use as shown on Table 1.

The geometric mean (GM) represents the central tendency of a series of datapoints and is considered to be the statistical method of choice when interpreting a series of bacterial measurements taken over a period of time. "In contrast, a single sample with a high value does not necessarily indicate that the waterbody as a whole has high bacterial levels" (Citation from page 41722, Federal Register, Vol. 69, No. 131, July 9 2004/Proposed Rules). This is especially true when the majority of sample results are under SSM. The proposal of having "the SSM as a value not to be exceeded," has little, if any, statistical merit. It is observed from Figure 1 that individual sample values as high as 100 to 1,000 per 100 ml or so may be observed in a series of data with a geometric mean of 35 per 100 ml. The adoption of SSMs never to be exceeded will clearly result in our being overly protective, and will: 1) cause unnecessary beach closures; 2) require regulatory action which may be more restrictive than is necessary for the protection of public health; and 3) adversely impact public perception and the local economy. Therefore, the GM should be the only water quality parameter that regulatory agencies should be required to use as the water quality standard for beach closure actions. The criteria document is clear in that illness was not related to individual measurements of enterococci density, but rather to the geometric means of a series of samples. It is therefore the geometric mean of 35 per 100 ml from a series of samples, which is related to the illness rate of 19 per 1,000 swimmers and not to individual sample values.

Footnote:
[1]USEPA. 1986. Ambient Water Quality Criteria for Bacteria-1986. EPA-440/5-84-002.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 139

Comment:
Allow for exceedence of the SSM when making attainment decisions. Under this option, an unacceptably high value for any individual sample may be used to trigger a beach advisory, closing or additional monitoring, or it might be evaluated with other sample results, but would not necessarily be used alone to determine nonattainment of the water quality standards. (Citation from page 41725, Federal Register, Vol. 69, No. 131, July 9, 2004/Proposed Rules)

This is a better alternative to the use of an SSM as a value never to be exceeded. However, when an adequate monitoring program is available, the final rule should not require that an exceedance of an SSM trigger mandated regulatory action (advisories, closings or additional monitoring as EPA suggests) but rather serve as an alerting value to the regulatory agencies that an evaluation and potential re-sampling and reassessment is warranted. SSMs should be viewed and used solely as an operational tool by local health departments and beach operators.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 140

Comment:
SSMs would be part of the water quality criteria, but only used for making beach closure and opening decisions. States and Territories could use only the geometric mean for other CWA purposes such as NPDES permitting, TMDLs and waterbody assessments. EPA may decide to

include an explicit interpretation or definition of the SSM in the final regulatory text. (Citation from page 41725, Federal Register, Vol. 69, No. 131, July 9, 2004/Proposed Rules)

This is the most desirable alternative among the four proposed alternatives, providing EPA explicitly interprets and/or defines the SSM as a discretionary management tool where satisfactory monitoring data are available. Use of the GM for beach opening and closing decisions will minimize the effect of single high measurements that would otherwise be considered outliers. The GM statistical method has the most direct relationship to risk and is essential in determining more representative long-term water quality conditions, especially chronic pollution, when a sufficient number of samples have been taken over the course of the recreational season. Frequent exceedences of the GM criterion of 35 per 100 ml for marine water will likely be indicative of the existence of chronic contamination. SSM values should only be viewed and used as an operational tool or guide for making decisions for public notifications, nothing more, when sufficient monitoring data are available. "Geometric Mean" values should be used both as the water quality criterion for beach closure actions and TMDL determinations, an approach that has scientific validity and is, therefore, legally defensible.

We believe that many local regulatory authorities have sufficient information to make scientifically reliable determinations and take correct regulatory actions, even if individual SSM exceedences occur. For example, local authorities can use the following tools to make a determination of statistical significance for a measured single sample exceedance: 1) on-going trends based on data collected from regular water monitoring and sample collection (often begun prior to the bathing season); 2) historical water quality data for the general ambient conditions, and probability distributions; 3) reports of pollution events from other regulatory agencies; and (4) practical knowledge of exogenous factors affecting the beach waterbody. Our Departments and many regulatory agencies have the aforementioned information available for contemporaneous evaluation.

If this alternative is adopted and SSMs are specified as water quality criteria, EPA must provide clear interpretation and/or definition of the SSMs as management guidance tools only to be used by regulatory authorities at their discretion when sufficient monitoring data are available. We believe that it would be beneficial to re-designate the term SSM to "Single Sample Value" (SSV) from "Single Sample Maximum" to avoid misinterpretation

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 141

Comment:
EPA would promulgate only the geometric mean in the final rule. The SSMs would be available for use as an implementation tool for making beach opening and closure decisions but would not be part of the applicable water quality standards. States and Territories would have the flexibility to use the SSMs in this or any other application of the water quality standards, as they deem appropriate. (Citation from page 41725, Federal Register, Vol. 69, No. 131, July 9,2004/Proposed Rules)

The technically appropriate element of this alternative is the promulgation of the GM in the final rule which would therefore serve as a required baseline criterion for recreational water use, NPDES permitting, TMDLs and waterbody assessments. However, by providing absolute flexibility to States and Territories to use the SSMs as they deem appropriate, there is the risk that some jurisdictions may apply the SSM values for the various regulatory actions cited above

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which would not be technically defendable. Consequently, we believe that it is more beneficial for EPA to propose a rule for national application with clear definitions: the GM to be used for beach opening and closing decisions, TMDLs and other regulatory requirements, and SSMs as discretionary operational tools for use by beach regulatory agencies when sufficient monitoring data are available.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 143

Comment:
As discussed above with regard to the application of SSMs, we believe that EPA's alternative interpretation number 3 comes the closest to being the technically defendable application of EPA's criteria document for bacteria and insures cost-effective protection of the public health and safety.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 144

Comment:
The main points that we recommend for your consideration are as follows:

1. The SSM values cited in the 1986 criteria document should be clearly defined in the proposed rule such that, when sufficient monitoring data are available, they are not to be considered as values never-to-be-exceeded but rather they are to be used as alerting values to regulatory agencies that an evaluation and potential re-sampling and reassessment is warranted at their discretion.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 145

Comment:
The GM value should be used as the water quality criterion for beach opening and closing decisions when sufficient data are available. In addition, the GM value should be used for TMDL determinations, NPDES requirements and waterbody assessment purposes.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 147

Comment:
The SSM should be re-designated as "Single Sample Value" (SSV) from "Single Sample Maximum" to avoid misinterpretation.

Organization Name: The City of New York Department of Health and Mental Hygiene
Document ID: 239
Comment ID: 148

Comment:
For purposes of beach management, it is recommended that the EPA consider the application of the geometric mean of 35 per 100 ml to varying flexible durations (e.g. less than 30 days), depending upon local conditions, when sufficient numbers of samples are collected. The application of a geometric mean for a period less than 30 days would not be applicable to TMDL, NPDES, etc.

Organization Name: Tri-TAC
Document ID: 223
Comment ID: 428

Comment:
Tri-TAC offers the following comments for your consideration.

The proposed steady state geometric mean indicator density of 35/100 ml of enterococci for marine waters is scientifically defensible for Southern California marine waters influenced by storm drain outlets as demonstrated by the Santa Monica Bay Restoration study.[1] Although this study defined an acceptable risk level in a different fashion from that discussed in EPA's proposed rule, the results are consistent with EPA's end result. The Restoration Study looked at relative risk levels to swimmers relatively closer and farther away from a source of pathogen contamination and used relative risk to confirm EPA's proposed geometric mean indicator density of 35/1100 ml of enterococci for local ocean waters as the concentration that increased swimmer illness. This is the same standard adopted by the California Department of Health Services in the California beach sanitation standards and the Los Angeles Regional Water Quality Control Board water quality objectives for ocean waters, and it is the same as the recommendation in the proposed amendments to the California Ocean Plan.[2]

Footnotes
[1] Haile, R.W., Witte, J.S., Gold, M., Cressy, R., McGee, C.D., Millikan, R.C., Glasser, A., Harawa, N., Ervin, C., Harmon, P., Harper, J., Dermand, J., Alamillo, J., Barrett, K., Mides, M., Guang-yu Wang (1999) "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff" Epidemiology, Vol. 10, Number 4:355-363.

[2] See Pages 22-23 of the Draft Functional Equivalent Document, Amendment of the Water Quality Control Plan Ocean Waters of California, State Water Resources Control Board, August 2004.

Organization Name: Tri-TAC
Document ID: 223
Comment ID: 429

Comment:
EPA solicited comment on the use of the Single Sample Maximum (SSM). Specifically, should the SSM be used as a single value never to be exceeded or, in the alternative, should EPA allow exceedances of the SSM when making attainment decisions because bacterial measurements are inherently variable? Tri-TAC supports the latter option, and proposes that high values for any given individual sample be used to trigger a beach advisory or closing or additional monitoring, or that such results be evaluated with other sample results, but not be used alone to determine attainment/nonattainment of the water quality standards. This approach is consistent with the proposed amendments to the California Ocean Plan, discussed above, which would use the SSM to trigger additional monitoring and, if necessary, a sanitary survey to determine the source of

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contamination. The concentration of fecal indicator bacteria varies over time scales that span several orders of magnitude, from minutes to decades and is due to a complex combination of local and external processes. No single sample result is an indication of the overall water quality for a given water body.[3] The geometric mean standard is a much better indicator of the attainment or nonattainment of a specific water body for bacteria as it addresses the overall assessment of water quality.

Footnote
[3] Boehm, A.B., J.H. Kim, S.L. Mowbray, C.D. McGee, C.D. Clark, C.M. Foley, D.E. Wellman, S.B. Grant (2002) "Decadal and Shorter Period Variability of Surf Zone Water Quality at Huntington Beach, California" Environmental Science and Technology 36:3885-3892.

Organization Name: William Hastback
Document ID: 157
Comment ID: 451

Comment:
EPA indicates that the new proposed enterococcus standards will have both geometric mean and upper limit components, perhaps a 75th or 90th percentile. In the Draft Review, EPA does not specify the statistical method that would be used for calculating the estimated the 75th or 90th percent value from the existing data set. There are different methods for doing that.

Organization Name: Wisconsin Department of Natural Resources
Document ID: 176
Comment ID: 109

Comment:
The Section agrees with the alternative option for use of the single sample maximum (SSM) in Section III. B. 1. titled, *Use of the Single Sample Maximum*. In this option EPA is proposing that the SSM be used to trigger a beach advisory or closing but not necessarily be used alone to determine nonattainment of the water quality. SSM results can be quite variable due to a number of factors and these results may not reflect the underlying water quality. We agree that the 1986 bacteria criteria document discusses SSMs solely in the context of beach closures and should not be used for other CWA purposes, such as NPDES permitting, TMDLs and waterbody assessments. Instead, only the geometric mean should be used for those purposes. Since, in the 1986 study, the geometric mean was correlated with the average gastrointestinal illness rate and has the most direct relationship to the illness rate, we agree that EPA should promulgate only the geometric mean in the final rule.

Response:
See the preamble to today's rule, in particular section IV.B.3., Use of the Single Sample Maximum.

Several commenters suggested renaming single sample maximums to some other term. EPA declines to make this change in order to remain consistent with the terminology in EPA's 1986 bacteria criteria.